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THE SCARCITY OF WATER IN THE MIDDLE EAST

by

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Preface

Water issue in the Middle East is considered an overwhelming issue in the region, which has witnessed a lot of conflicts in the last 30 years. This issue has now a great linkage with the on-going peace process and it can not be separated from the whole objective of reaching stability and promoting prosperity among the regions population. In essence, water in the Middle East countries will face a very serious situation concerning this issue in future. All the survey reports by the international agencies conducted in this issue show that there would be a serious scarcity in water in the Middle East region. Therefore, a combined effort by the region's governments to find a rational solution will enable them to avoid any unpredicted conflict and will enhance the cooperation among those states.

This issue took a lot of my thoughts and encouraged me to find out more details about it in order to drag the attention of my military colleagues who would be interested in finding more about the importance of this issue. In this regard, I would like to acknowledge the effort of my CI Major Glenn Carlson who has helped and guided me to complete this project.

Abstract

The water resources in the Middle East consist of those rivers situated mainly in Turkey, Syria, Jordan, and Egypt, and flow to other countries such as Iraq and Israel. The water it- self will face a scarcity in many of those countries as the population rate increases and water levels decrease. Therefore, a mutual effort between those countries to enhance cooperation is essential as many of those countries pursuit peace and stability in the region.

As we know that the Middle East went through very crucial times in the past 40 years and witnessed three major wars where a lot of financial resources were consumed. The situation after the last Gulf War had changed and both the U.S and Russia called for the peace process between Israel and its neighbors to overcome more than fifty years of hostility between them. In every negotiation, the water issue was and still is in the agenda, as it became very sensitive issue. A lot of scholars expressed their concern in looking at the deferent effects of water in the Middle East and how this issue would impact the deferent relationship among its countries.

Turkey controls the majority of the water resources in the region. It recently built a dam in Euphrates River to control more water. In addition, it built a solid relationship with Israel, which might be given some of that water. On the other side, Turkey has an unstable relationship with Syria, which has caused shortage in the quantity of water. As a consequence, Syria has been supporting the Kurd rebels in southern Turkey. All countries in the Middle East are called now for more cooperation in all aspects and have to look to the prosperity of the population living in that region regardless of religion, languages and customs to achieve a better future.

Part 1

Introduction

The overwhelming problem in the Middle East at the present is water; a vital resource for all countries. In fact, the Middle East will pass to a critical situation if the region's countries do not address their concern to solve the water problems. The importance of water in this region makes it more inevitable for the local governments to give more attention to this issue. Many political decisions, economical agreements, or strategies for peace will include water as an instrument for peace. Since it is a very wide subject, it touches the complexity of the Arab-Israeli peace process. Agreement on the cooperation use of the region's water resources would be a major building block in the construction of peace in the area.[1]

The need for water is considered to be the need for life and in fact it is the lifeblood of all human and natural systems. The water scarcity in the Middle East is an important and yet sensitive issue that has a great linkage to the peace process conformation in the region and a tremendous influence in every attempt to enhance a good relationship between the countries in that vital region. The status quo necessitates a great concern to the Middle East leaders to overcome their differences in this issue to ensure a better future for the new generation so that conflict in the future is prevented. They should also re-establish a solid foundation for more

[1] Economic cooperation in the Middle East by Gideon Fishelson, p.303

cooperation in economic, and trade, issues with looking to the future with more wisdom to promote prosperity within their public. [2]

The Arabs and Israelis have lived in a critical situation since the State of Israel was established in May 1948. Both parties have witnessed three Major Wars which have had sever consequences on each side especially in the economic aspects and have consumed the region's resources and destructed the infrastructure of the countries involved. After the Egyptian-Israeli agreement on peace in 1977 and since the Cold War ended, the need for enhancement of peace in the Middle East has become more important as the world has inspired more cooperation. The United States has led a persistent effort to get the Arabs and Israelis together in order to solve their outstanding problems. The peace process in the Middle East has achieved some encouraging progress to reach its finality as the Jordanians and Israelis have signed their peace agreement and came to a conclusion which enabled the two sides to get a final touch on the water issue. The Israelis and Palestinians have made a tremendous progress in their negotiations towards the final agreement. The Syrian-Israeli progress, which was achieved on the dynasty of the assassinated Prime Minister Rabin, was postponed by the dynasty of the former Prime Minister Netanyahu. The new government has more willingness to work with its neighbors to achieve comprehensive peace with Syria. In essence, Prime Minister Barak has formed a new mechanism for his government to advance the peace process.

[2]

Part 2

The Water Scarcity Overview

The Koran has addressed the issue of water and gives it more emphasis, as the water is one of those elements in which the human being was created. Water covers 70 percent of Planet Earth but fresh water composes only a little of the whole percentage. The total water covering the globe is of 1.41 billion cubic kilometers and it is spread over the earth surface. Most of this water is salty which cannot be used for drinking or cooking unless the salt is removed. A mere 3 percent of this quantity is considered to be fresh water, which is locked in the atmosphere, polar ice caps, and glaciers or in deep aquifers.[3] "According to a recent World Resources Institute report, less than 1 percent of all fresh water is available to satisfy human needs with the greatest share coming from surface water (i.e., lakes, rivers, and streams) and ground water (i.e., aquifers). To put this into perspective, if the world's total water supply were only 100 liters, the useable supply of fresh water would be only 0.003 liter, or 1 teaspoon."[4]

According to a report of a workshop held in Paris on March 18, 1998 concerning water in the Middle East, eighty percent of the available water in the Middle East is consumed by agriculture.[5] In Egypt, ninety eight percent of all water is used for the production of crops. The use of fresh water in crops has exceeded the use of human utilities (drinking, cooking, and washing). Water played very important role in the Industrial Revolution especially in generating

[3] World Water: war or peace by Majors Gallegos, Frank and Kinner, Jan p. 1
[4] . World Water: war or peace by Majors Gallegos, Frank and Kinner, Jan p. 2
[5] www4.gve.ch/gci/green crossprogramm/waterres/middleeast/waterinto.html p.5 dated 11/17/99

electricity, mining operations, and in the civilian sector such as constructing. In addition, water plays a vital role in the nuclear power plants that are used for the production of electricity. The amount of water consumed in this field has a great impact in the quantity of available environmental water resources. For example, it is essential in the oil industry to consume between 3,000- 34,000 liters of water to produce 1, 000 liters of gasoline.[6]

It was observed in 1990 that there was a tremendous fall in the average level of water in the Middle East. The Jordan valley was called the 'the water stress zone' in which the region lakes are the water resources to sustain the economic and the demographic growth by the impact of the Mother Nature. On the other side, Turkey is considered to be the "master" of the region's water and there is a great flow of water through Tiger and Euphrates. Turkey possesses some near 4500 m3 per capita per year, Syria 1300m3, and Iraq 4400m3 per year. According to a research on water in the Middle East, the Euphrates gets 98 percent of its resources from Turkey while only 28 percent of its basin lies on Turkey's territories. Similarly, Turkey supplies the Tiger with 45 percent of its strength.[7] In this context, Turkey, which firmly controls the upper land, has a great control on water flow to the other countries and wants to exploit water for some political reasons

In Egypt, the Aswan High Dam was constructed to guarantee the flow of water throughout the year and even in critical time of drought. In fact, Africa has witnessed the worst drought during this century, a situation that has a great affect in the percentage of storage of water. The water level declined as the drought continued in Ethiopia, which controls the Nile River. There

[6] World Water: War or Peace by Majors Gallegos, Frank and Kinner, Jan p.2
[7] Water in the Middle East LT COL Antoine Abisamra p.4

are high quantities of water, which evaporate, and seepage, which can worsen the demand for water in that area. [8]

The situation in the Middle East Region might face more difficulties, as there is more scarcity in water resources in the Jordanian Valley. Israel, Jordan and Syria have been through many conflicts concerning this important issue, and each country has expressed its deep concern on water shortage. The United States mediator in 1955 has managed to resolve the problem by reaching an agreement, which gave 570 million m3 of Jordanian River to Israel and 720 m3 to Jordan. On the other hand, the Yarmok waters were divided between Jordan and Syria, where 80 percent of such waters were allocated to Jordan and 20 percent allocated to Syria.[9]

The water scarcity in Gaza strip brings more attention to the analysts as it has a great affect in the peace process continuation. In this piece of land, the water scarcity is tied up with the function of the population growth; an agriculture intensive economy, a fragile water ecosystem, and an inequitable distribution of water. The weather in Gaza has another effect in the water shortage. It has a high potential of envirotranspiration of between 1,040 and 1,900 millimeters per year for Gaza as whole. The quantity of annual rainfall in Gaza is very limited (117 million cubic meters), and only 40 percent of this water is reserved in the aquifers while the remainder is lost through surface to the Mediterranean or through evaporation. [10]

The population growth has a tight linkage with the water scarcity in the Middle East region. It has been addressed that the growth of population rate in the Middle East is the highest in the world. According to Arab studies 40 percent of the world population especially in the developing countries already suffer a shortage in the source of water. The World Bank alluded this growth in 1983 report from 217.4 million people to 337 million by the year 2000. The

[8] The New Middle East by Shimon Peres p.125
[9] Water in the Middle East LT COL Antoine Abisamra p.9

population growth in Syria, Iraq and Saudi Arabia shows an increase of 3 and 4 percent a year as the population increase in Lebanon, Turkey and Kuwait by 2 percent a year. The Israeli population also has an increase of 1.5 percent however this does not include the immigrants from the former Soviet Union[11]. "The World Bank's Report (October 1993) titled "Special Strategy for Water Administration in the Middle East and North Africa" warned Middle East governments to seriously prepare for the forthcoming environment challenges. National institutional reforms and international treaties on shared water are preconditions for optimum development and management in the year 2025. Population in the Middle East will be almost doubled from 220 million to 450 million."[12]

We understand that whenever there is a growth in population the demand for water increases as the security increases between states and this has a greater linkage with the demand for agriculture and food production in addition to the water need for the industries plants. The higher level of population can lead to environment stress in resources such as the degradation of culture land, forests, water and fish stocks. This assumption leads to a factor that the scarcity in water leads to another factor, which are the quality and the quantity of water in which, the population use.

In general, new demands for water are putting pressure on existing supplies. The minimum annual water requirement varies between 75 and 150 cubic meters per person for drinking, sanitation, and all commercial and industrial activities. Supposedly, it takes 150 per capita-cubic meters in the Middle East countries; under projected population growth. Over the next few decades, Syria has to completely eliminate the irrigated agriculture. The same scenario might

[10] http://utl2.library.utoronto.ca/www/pcs/gaza/gaza.htm
[11] World Water: War or Peace by Majors Gallegos, Frank and Kinner, Jan p.7
[12] Environmental Warfare: Water in the Middle East. By Col. Awar Kamal Abbas p.2

happen to Israel, which has to apply a severe restriction on agriculture.[13] In the Gaza side, the rapid growth of population needs for drinking water alone may soon outstrip safe supply.

[13] Environment Warfare: Water in the Middle East by Col. Awar, Kamal Abbas p.2

Part 3

Previous Water Conflicts

The Shat Al-Arab Dispute

The Shatt al-Arab is formed by the confluence of the Tigris and Euphrates rivers just above Basra in Iraq. It carries these and the waters of a downstream Iranian tributary, the Karun, into the Arab - Persian Gulf.[14] Shatt al-Arab has been creating many conflicts through out the history. The relations between the Mesopotamia and Persia had a great reflection on the Shatt al-Arab borders. In addition, since 1847 and the outbreak of World War One, the Iraq has never controlled the Shatt al-Arab according to the second treaty of Rzerum. World War One brought a new usage as the British occupied the West Bank of Shatt al-Arab and the river came under the administration of the British authorities located in Basra. The British authorities created the port directorate to control the navigation of ships through this important access. Persia at that time did not accept this unilateral step and Reza Shah who was ruling Persia at that time made several protests against it until 1929 when Baghdad became more willing to discuss the Shatt al- Arab frontier.

In the1930s the relationship between the two states had witnessed serious tensions that resulted on the Shatt al-Arab and land frontier. In November 1934, Iraq complained to the League of Nations that Iran did not fully comply with the 1913 protocol and the subsequent of the Delimitation commission. In addition to that, Iraq has emphasized the importance of Shatt al-Arab to its own interest, as it is the only outlet to the regional waters.

After these events, disputes between Iraq and Iran had never stopped and Iran had claimed that the 1913 protocol had given the country the right to extend its boundaries. Iran then suggested that the borders of Shatt al Arab should be governed by the International Law. But after a successful mediation by the League Council between the two countries, Iraq and Iran reached an agreement in 1937, which endorsed the 1913, and the1914 protocols. [15]

After the Islamic revolution took place in Iran, its leader called for overthrow of the Iraqi leader Saddam Hussein which led the Iraqi government to declare war against Iran and announced the Iraqi sovereignty over the entire Shatt al-Arab water way.[16]

Nile Crisis

Egypt proceeded in building the Aswan High Dam after the Egyptian revolution of 1952 to achieve several objectives such as protect Egyptian agriculture from variation of the flow of Nile from time to another and to extend the cropping along the Nile. This project deteriorated the relationship between Egypt and Sudan. The storage capacity of the High Dam was projected at 156.000 MCM, of which some 30,000 MCM would be dead storage (i.e., unusable).[17]

The project was expected to expand the Egyptian cultivated land by 1.2 million feddans, (each faddan equals approximately 4.2 thousand cubic meters) allowing Egypt to exploit more agriculture production. The project has opened a debate of conflict between the two countries.[18]

The first issue was whether the Aswan High Dam would be a unilateral or cooperative venture. Although Egypt has announced that the High Dam would bring more cooperation

[14] Water in the Middle East conflict or cooperation edited by Thomas Naff and Ruth c. Matson p.101
[15] Water in the Middle East conflict or cooperation edited by Thomas Naff and Ruth c. Matson p.106
[16] htth://ut12.library.utoronto.co/wwww/pcs/gaza.htm p.110
[17] Water in the Middle East conflict or cooperation edited by Thomas Naff and Ruth c. Matson p.145
[18] Water in the Middle East conflict or cooperation edited by Thomas Naff and Ruth c. Matson p.145

between the beneficiating countries, this debate has not come to reality until 1954 when Sudan was called for this venture. [19]

The second dispute focused on the rationale for water-sharing quotes Egypt has claimed that it has no other alternative water resources to counter the annual population growth rate that exceeds 2.5 percent and therefore has to depend up on the Nile while Sudan could utilize alternative water resources. In contrast, the annual Egyptian rate of population growth is higher than the Sudanese population growth. The Sudanese have rejected the idea of "primary needs" formula which was set up by the Egyptians and asked for more equitable sharing which would take into consideration the 11 million population of Sudan and the fact that Sudan would not be able to rely on the rainfed agriculture. It also saw that it was entitled for 44,000 MCM/yr.[20]

Negotiations to look into the water issues between the two countries began in September 1954, but due to some nationalistic politics the negotiations broken off. The situation deteriorated and brought the two countries to a military confrontation in 1958.

In another step Egypt had asked for U.S aid to execute the Dam project but its demand was rejected, as the Egyptian government was following the communist movement at that time. Egypt turned to Soviet Union to finance the Dam in which Soviet agreed to the Egyptian demand. In fact this step has enhanced the cold war between the two great powers in the world.[21] The water issue between the two countries still constitutes the joint Bon of the enhancement of their relationship. Recently the Sudanese government has threatened Egypt to use water as an instrument to put more pressure on the Egyptian government in order to stop the Egyptian entire support to the rubbles in the southern of Sudan. This led the Egyptian government to respond by using all available measurements and assets to prevent its right of water flow from Nile.

[19] Water in the Middle East conflict or cooperation edited by Thomas Naff and Ruth c. Matson p.145
[20] Water in the Middle East conflict or cooperation edited by Thomas Naff and Ruth c. Matson p.145

The Syrian – Iraqi water conflict of 1974-1975

The scarcity of water can raise the attention of a country to counter the threat of a neighboring country. At the present time, we have seen many countries mobilizing their efforts to ensure that the flow of water will not be threatened.

In 1975, Iraq has called for an Arab League's foreign ministers meeting claiming that Syria reduced the flow of water from Euphrates from 920 m3/sec to 197-m3/ sec. This Syrian behavior endangered the lifehood of more than three million Iraqi farmers who depend upon this river for irrigation water. Iraq threatened Syria that it would pursuit any kind of force to secure the agreed percentage of water flow to its homeland. At the same time, Syria announced that it passes 71 percent of the water flows from the Turkish territory to Iraq.[22]

This dispute continued to set worse and by the end of April the Arab League formed a "technical committee" to mediate between the two countries, but Syria had refused to participate in it. Saudi Arabia led a meeting between Syria and Iraq to overcome this dispute, but the situation had worsened between the two countries. Syria closed its airspace to all Iraqi aircraft and stopped all flights to Baghdad.[23]

In another step of the water dispute between the two-country Syria drew some troops from Southern front of its border with Israel to counter the Iraqi threat. Iraq threatened that it would bomb the dam at Tabqa. Again Saudi Arabia sent its mediator in an attempt to finalize the water dispute between the two countries. By Jun 1975 the Saudi mediators succeeded to achieving an understanding between the two countries. Although the two countries reached a solution for

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[21] Water in the Middle East conflict or cooperation edited by Thomas Naff and Ruth c. Matson p.146
[22] Water in the Middle East conflict or cooperation edited by Thomas Naff and Ruth c. Matson p.93
[23] Water in the Middle East conflict or cooperation edited by Thomas Naff and Ruth c. Matson , p.94.

their water dispute, it has not prevented the two countries from claiming each other some other matters using the water as a slogan for their continuing conflict.

Part 4

The Water Scarcity and The Potential of War

Water is considered to be a fleeting resource that doesn't last for long because of the human use and the nature effect. Thus this resource has played a significant role in the wars throughout history. In 687 BC, Sennacherib of Assyria in retribution for the death of his son, destroyed the city of Babylon by destroying the water supply canals to the city. In addition, the recent Gulf War had proved the paramount importance of the water resource when the Iraqi government placed human shields to protect its own dam facilities from allies strategic bombing. Moreover, the conflicts between states occur when there is a change in the water quality or quantity. Meanwhile any type of pollution of water can be a strong indication of escalating war between the states as the upstream consumers may cause downstream consumers to implement an expensive purification work as well as other aspects connected with this issue. In 1980, Iraq has claimed the sovereignty over the entire Shatt Al-Arab and initiated the war against Iran.[24]

The water in the Middle East will be sought more than any other resource and the need for it might bring the region to an unpredictable situation as the demographic level is in a continuous process. As stated earlier, the annual growth rate of population in Iraq, Syria, Jordan, and Saudi Arabia has been registered in the past few years between 3 to 4 percent. However the population growth in Lebanon, Kuwait and Israel, is between 1.5 to 2 percent for which the need for fresh water will be more intensive and crucial.

[24] World Water: War or Peace by Majors Gallegos, Frank and Kinner, Jan p.5

According to Majors Frank and Kinner, and Jan on their research on the World Water, "war or peace, the Jordanian River is considered to be the most intractable water management problem in the Middle East and most of these problems occurred between Israel and Jordan. Water was an important issue in the Arab- Israeli war of 1967. Many correspondents enhanced this notion as the Arabs were unsuccessfully trying to divert the Jordanian River to the other Arabs Rivers. Meanwhile, the Israeli occupation of the Golan Hights had prevented the Arabs from doing so. In addition, their occupation of the West Bank allowed them to maintain 20 to 40 percent of Israeli fresh water supply from Jordanian River. The Israelis are able to get water from the Green Line and from the aquifers main recharge area in the Jordanian River, which lies on the West Bank as Israel occupies the Golan Hights and the West Bank. Israel has restricted the amount of water that the Arabs can get from the aquifers. This environment of water problems in the area has a great potential of conflict escalation between the people living in the West Bank and the Israeli State. Even though the peace negotiations have the potential to secure this problem but it will stand as a sensitive issue which will consume a lot of effort to get into a standable process between the two old adversaries.[25]

Another area of potential conflict in the Middle East is the River of Tigris and Euphrates that flow from Turkey through Syria to Iraq. In fact, Syria and Turkey have entered a lot of negotiations on water issues but to date they failed to reach a final understanding agreement between one another. On the other side of the such rivers the Iraqi and Syrian governments were about to get them into a prolonged war when the Syrians built their Tabqa Dam and Iraq claimed that Syria reduced the flow of water from Euphrates by 75 percent. The Iraqi government indicated that it would take any necessary action to restore the flow of water from Euphrates. The Saudis intervened to solve this problem and reached a solution with the Syrian government

[25] World Water: War or Peace by Majors Gallegos, Frank and Kinner, Jan p.8

that allowed Iraq to receive more water from Euphrates. [26] All of these situations show clearly that water in the Middle East has the greatest potential for causing war in the Middle East. Those examples presented in this paper are few of that going –on in the region.

[26] World Water: War or Peace by Majors Gallegos, Frank and Kinner, Jan p.10

Part 5

The Water Projects in the Middle East and the Possibility for Peace

The world diverted its vision after the Gulf War to the Middle East and looked forward to enhance cooperation between the conflicting parties in that region. Meanwhile, many states such as the United States and the European countries have great interests in promoting peace and stability between the Arab states and Israel. In essence, the Middle East peace process that took place immediately after the Gulf War and provided a lot of advancement, which has resulted in the Israeli-Jordanian peace agreement, and the Palestinian regain of West Bank. These agreements have a significant linkage with water issues that catalyze some previous conflicts between the Arabs and Israel. As the two old adversaries approach more advancement in the peace process especially after the Syrian - Israeli recent peace progress, some scholars have written about the future water projects that they think will enhance cooperation and peace between the conflicting parties in the region.

Water Projects in the Middle East from an Israeli Point of View

In his book, *Economic Cooperation in the Middle East*, Gideon Fishelson states, "the Yarmuk River is one of bigger water resources in the Middle East, with an annual flow of some 500 million cubic meters." The river was distributed among the riparian countries, Syria, Jordan, and Israel. According to a tacit agreement, higher amounts of water were allocated to Jordan. The winter floodwaters, which fall into the Yarmuk River, could be maintained by constructing

upstream dams or changing the direction of their flow to their natural reservoir, (Sea of Galilee). This solution will solve the Jordanian problems of water in the near future, as the investment of this issue would cost less than constructing an upstream dam. The Jordanian would have an additional 100 million cubic meters a year and this quantity is considered to be a substantial quantity for Jordan short term requirements. [27]

On the other hand, such proposal might work for the Israelis who obtain 500 million cubic meters a year from the Galilee Sea by exploiting the Yarmuk winter floodwaters which Jordan can not utilize due to their limited storage facilities by pumping them to the Israelis central regions. Also, the diversion of the River into its natural reservoir would benefit Israel, as the diversion would reduce the salinity of Yarmuk's water by 20 percent.[28] This proposal will reduce the losses of the Yarmuk River but it will stress the Jordanians in the summer time and put a great impact on them particularly in dry winters. Thus to solve this problem it is suggested that, water from the Yarmuk might be supplied to the West Bank via either existing Israeli or Jordanian pumping station, or through additional pumping station. This will provide an optimal distribution with storage capacity that minimizes the runoff of water.[29]

Another project, which can play a significant role in the Middle East cooperation in terms of the Israelis point of view, will be the Nile waters. They see the surplus of the Nile waters, which is accrued by the high capacity of Lake Nasser that reserve billions of cubic meters would be enough to solve the other areas of water problems. These waters can be transferred to the north and east into the Gaza Strip, the Israeli Negev, and, in certain conditions to the West Bank and to Jordan at a substantial cost. Meanwhile, and to promote this project, the Egyptian and Israeli governments would have to coordinate their effort to distribute the Nile waters to third parties

[27] Economic cooperation in the Middle East by Gideon Fishelson p.310
[28] Economic cooperation in the Middle East by Gideon Fishelson p.303

which will enhance the ongoing peace process. Egypt can exploit an efficient method of irrigation system to increase the agriculture production and the city development without absorbing the full scale of the surplus waters. Furthermore, the Egyptian plans to transport the Nile water to the Sinai Peninsula and create an irrigation work there, would cost them to build a canal a long the Mediterranean shore that could be well invested economically. The Egyptians will be able to transport the Nile waters both northward and eastward. It is also considered to be cheaper for Israel to receive water from the Nile than receiving it from the Sea of Galilee. Waters transferred to Israel from the Sea of Galilee requires an energy cost of 2-3 kwh per m3 while pumping the waters from Nile would cost only less than 1 kwh per cubic meters. If this happens, it would allow Israel to exchange the waters received from the Sea of Galilee to Jordan and West Bank.

The Israeli-Lebanese cooperation in water is a vital issue in promoting peace in the Middle East region as the peace process is witnessing more advances with the Syrian- Israeli negotiation. The cooperation in terms of water would give an optimal path in resolving the other differences between the two countries. Therefore, the most significant cooperation between Israel and Lebanon lies on the conveyance of the surplus water of the Hasbani and Ayoun Rivers through Israel to Jordan, West Bank or to Israel itself. Also, the other aspect of cooperation between the two countries lies on the exploitation of water flow to Israel as a part of its share in the region's water resources for the purpose of generating electricity power.[30]

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[29] Economic cooperation in the Middle East by Gideon Fishelson p.312
[30] Economic cooperation in the Middle East by Gideon Fishelson p.317

Part 6

CONCLUSION

The issue of water is the most important issue in the relationship between the Middle East countries, and it is an issue that can trigger the conflicts in the region. Through history and since the State of Israel was established in 1948, the region has witnessed three major wars that consumed resources and treasure of the countries involved and brought fear and anxiety to the Middle East population.

The world has exerted more effort since the Cold War and the Gulf War for more cooperation in every aspect to meet the purpose of promoting prosperity and enhancing stability all over the world. The Middle East countries have significant opportunities to overcome their political differences and escalate prosperity among their population. The water issues may consume the peace negotiation efforts to bring peace to the region, but with more understanding of the population needs for peace and cooperation, these differences have the potential to diminish. In this research I have touched on the water projects from an Israeli point of view which can effectively be studied by the other Arab countries and see what the advantages and the disadvantages of those proposals are and how they can be adjusted to meet their requirements.

As we all know that the United States plays the biggest effort to resolve the differences between the Arab States and Israel. Subsequently it is the U.S. responsibility as a superpower which has a wide presence in that region to enforce the countries, that stray out of those water

agreements issues. In addition to that preventing any attempt by any country to spoil an effort, which has taken a considerable time to be reached.

Bibliography

Economic Cooperation in the Middle East by Gideon Fishelson World.

Water: war or peace by Majors Gallegos, Frank and Kinner, Jan.

Www4.gve.ch/gci/greencrosspramm/waterres/middleeast/waterinto.html dated 11/17/99.

Water in the Middle East LT Col Antoine Ebisamra.

The new Middle East by Shimon Peres p.

http://ut12.library.utoronto.co/wwww/pcs/gaza/gaza.htm

Environmental warfare: water in the Middle East. by Col. Awar Kamal Abbas.

Water in the Middle East conflict or cooperation edited by Thomas Naff and Ruth C. Maston.